

Supporting Information for

# Controlled Biodegradation of an Additively Fabricated Capacitive Soil Moisture Sensor

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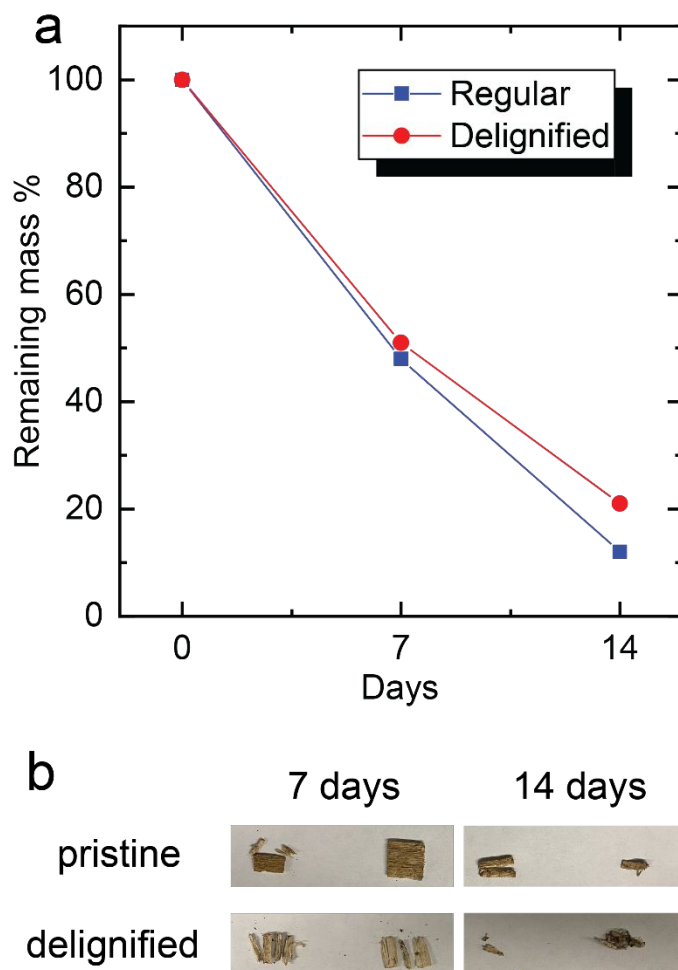
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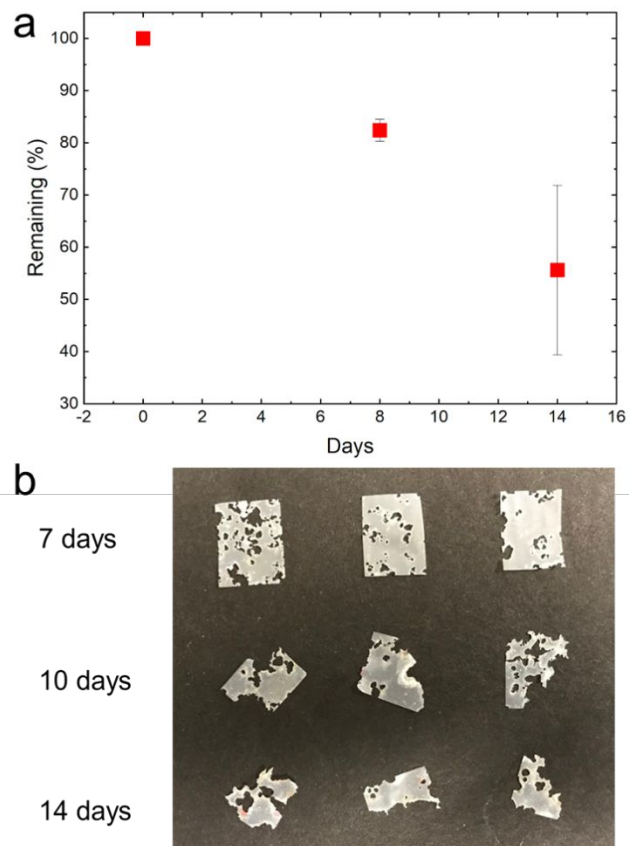
-7 pages (including the cover page)

-6 Figures

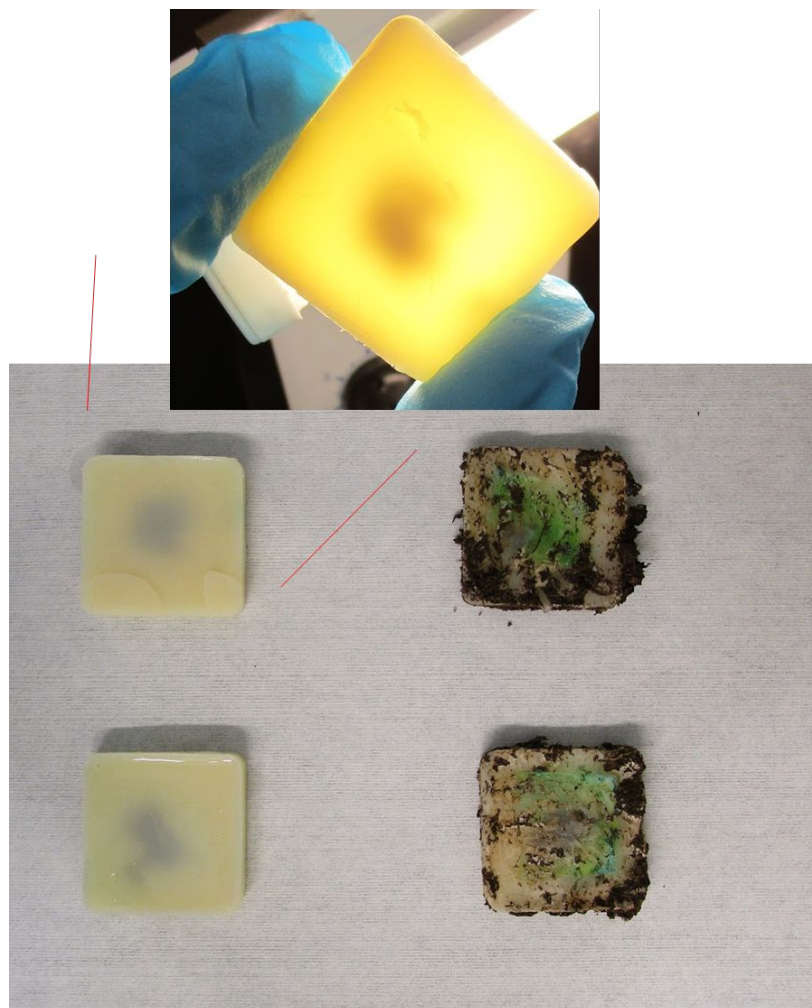


**Figure S1.** (a) Mass loss of pristine and delignified balsa wood as a function of time, (b)

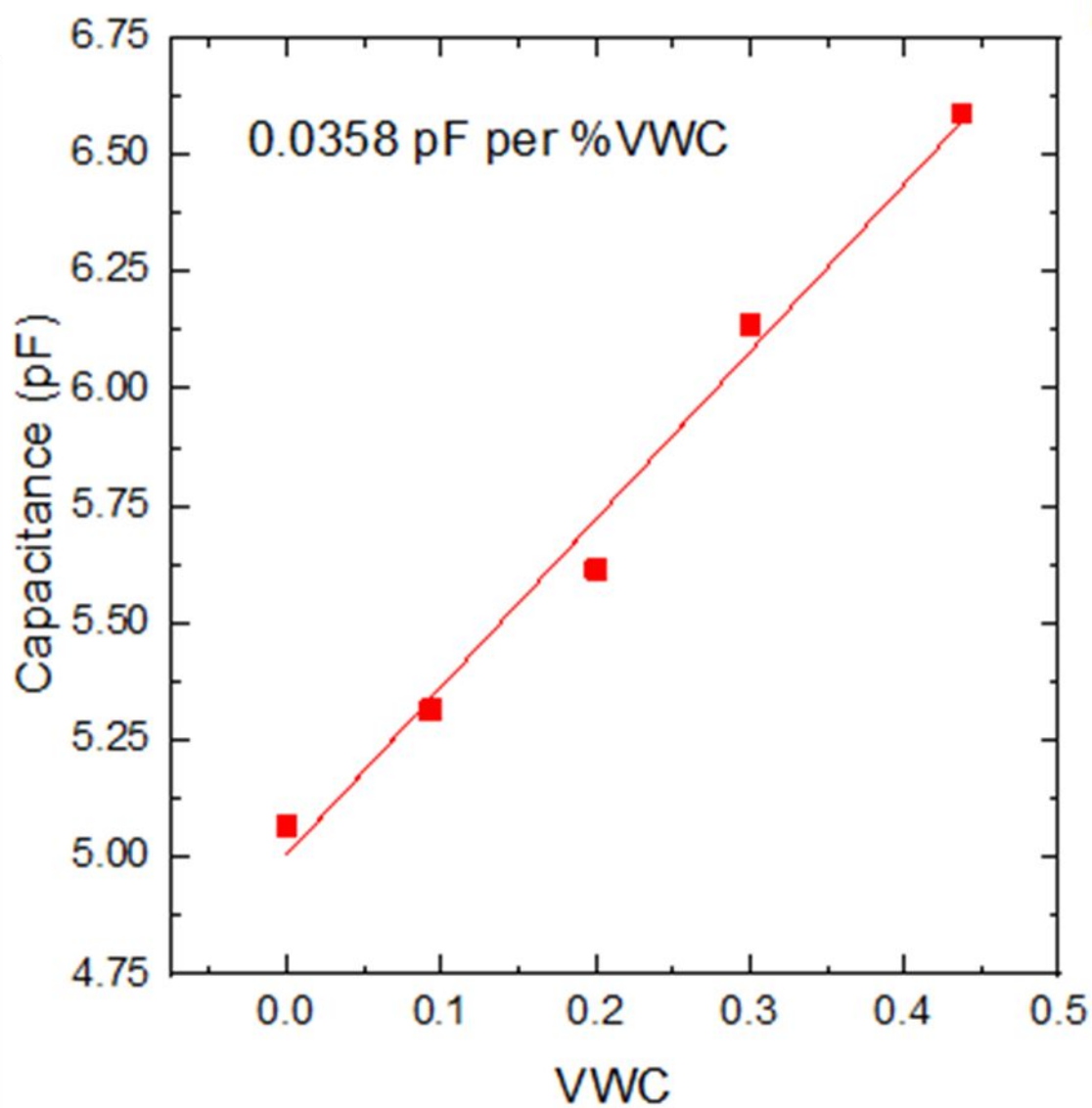
photos of pristine and delignified retrieved from soil after 7 and 14 days.



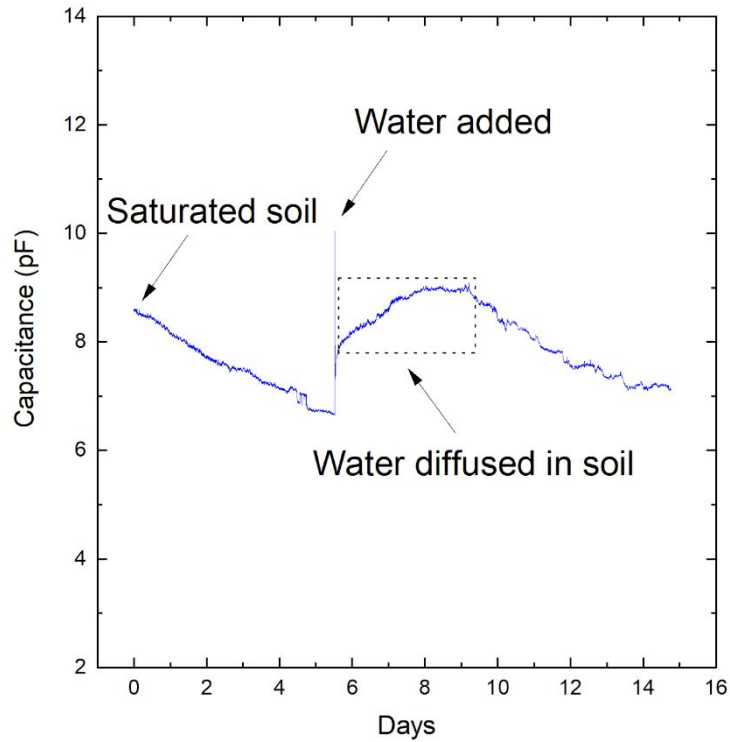
**Figure S2.** (a) Mass loss of PHBV films as a function of time, (b) photos of PHBV films degraded in soils for 7, 10, and 14 days.



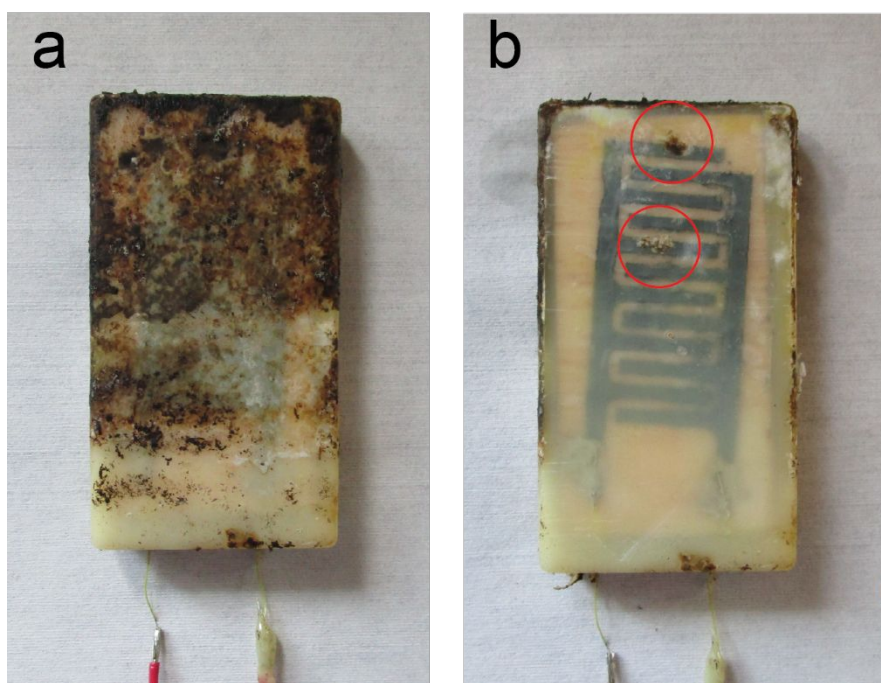
**Figure S3.** Photos of wax encapsulated moisture indicator ( $\text{CuCl}_2$ ) placed in water (left) and hydrated soil (right) for 1 week. The encapsulated moisture indicator in water was still dry (brown color) while the encapsulated moisture indicator in soil had absorbed water (green color).



**Figure S4.** Calibration curves of the moisture sensors with 1.0 mm-thick wax encapsulation tested in sand.



**Figure S5.** Response of a 1 mm-thick sensor to a decreasing amount of water after being installed in saturated soil (72% VWC) on day 0 and an irrigation cycle on day 5. The sensor was connected to a LCR meter for continuous monitoring. A battery-powered fan was used to circulate air near the soil to accelerate the evaporation of water. The sensor was continuously measured for 15 days. At the end of the fifth day, a total of 52.1 g of water was poured to the soil to compensate the loss of water due to evaporation.



**Figure S6.** (a) a photo of the moisture sensor with 0.8 mm-thick encapsulation retrieved from soil after it functionally failed, (b) a photo of the moisture sensor after the soil-fused wax layer was scraped off.

